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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/983,002	10/17/2001	Griffith D. Neal	8864-24	7769

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EXAMINER

HEITBRINK, JILL LYNNE

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Interview Summary

Application No.

09/983,002

Applicant(s)

NEAL, GRIFFITH D.

Examiner

Jill L. Heitbrink

Art Unit

1732

ehb

All participants (applicant, applicant's representative, PTO personnel):

(1) Jill L. Heitbrink.(3) Griffith Neal.(2) Steven Shurtz.

(4) \_\_\_\_.

Date of Interview: 30 June 2004.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
If Yes, brief description: \_\_\_\_.

Claim(s) discussed: 1-75 and proposed amendment.

Identification of prior art discussed: Viskochil, Rosato.

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Discussed the effects of expansion and contraction on the components. The significant changes in resonance spectrum with the pressure difference in cavity and gradient. Discussed the correction of the 112's which appear correct.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

  
Examiner's signature, if required

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

#### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Proposed claim amendments and claims for discussion during telephone interview on June 30, 2004  
Serial No.: 09/983,002

1. (Currently amended) A method for injection molding a layer of phase change material around a surface of [[each of]] a [[plurality of identical]] hard disc drive [[components]] component comprising:
- a) providing a [[plurality of identical]] hard disc drive [[components]] component ;
  - b) placing [[one of]] said [[plurality of identical]] hard disc drive [[components]] component in a mold cavity of an injection molding machine having a controllable fill rate and a controllable injection pressure;
  - c) closing said mold cavity;
  - d) injecting a molten phase change material into said mold cavity at fill rates and injection pressures;
  - e) monitoring and controlling pressure in the mold cavity during the injection of the molten phase change material; and
  - f) controlling the fill [[rate]] of said molten phase change material during the injection of the molten phase change using a valve gate to obtain said hard disc drive component with the phase change material thereon[[; and
  - g) repeating steps b)-f) to produce said plurality of components each having a substantially uniform resonance spectrum]].

1a. (New) The method of claim 1 wherein the step of controlling the fill comprises controlling the fill rate of molten phase change material using said valve gate.

1b. (New) The method of claim 1 wherein the step of controlling the fill comprises controlling the amount of molten phase change material injected using said valve gate.

1c. (New) The method of claim 1 wherein the step of controlling the fill comprises closing said valve gate when a predetermined mold cavity pressure is reached.

2. (Currently amended) The method of claim 1 wherein the pressure is monitored at [[a runner to the mold cavity,]] a beginning-of-fill point and an end-of-fill point.

14. (Currently amended) The method of claim [[13]] 1 wherein [[the]] a controller starts and stops the flow of molten material into said cavity by opening and closing [[a]] said valve gate [[associated with said cavity]].

18. (Currently amended)(needs further revision) The method of claim 1 wherein said plurality of said hard disc drive components comprise at least one hundred components with phase change material thereon, said at least one hundred components having a median first order frequency and wherein each of said at least one hundred hard disc drive components with a phase change material thereon has a first order frequency that is within about three hundred Hertz of said median first order frequency.

32. (Currently amended) A plurality of hard disc drive [[component]] components made by the method of claim 1 each having a substantially uniform resonance spectrum.

33. (Currently amended) [[An]] A plurality of electronic [[device]] devices each comprising at least one of the plurality of the hard disc drive [[component]] components of claim 32.

34. (Currently amended) A method of manufacturing hard disc drives having a reproducible resonance spectrum comprising:

- a. providing a plurality of identical hard disc drive component sets, wherein each of said sets consists of components that are used in a single hard disc drive;
- b. placing and positioning one of said plurality of hard disc drive component sets in a mold cavity of an injection molding machine;
- c. closing said mold cavity;
- d. monitoring the pressure inside the mold cavity [[at an end-of-fill point]];
- e. injecting a molten phase change material into said mold cavity to a pre-determined [[set point]] cavity pressure gradient; and
- f. repeating steps b)-e) to produce a plurality of hard disc drives each having a substantially uniform resonance spectrum.

34a. (New) The method of claim 34 wherein the monitored pressure includes the pressure at an end-of-fill point in the cavity.

39. (Currently amended) The method of claim 34 wherein said set of hard disc drive components comprises a stator [[, voice coil motor]] and a base plate.

40. (Currently amended) The method of claim 34 wherein said plurality of said hard disc drive component sets comprise at least one hundred component sets with phase change material thereon, said at least one hundred component sets having a median first order frequency and wherein each of said at least one hundred hard disc drive component sets with a phase change material thereon has a first order frequency that is within about three hundred Hertz of said median first order frequency.

45. (Currently amended) The method of claim [[34]] 35 wherein said set of hard disc drive components are unitized by said monolithic body.

46. (Currently amended) A method for injection molding a layer of phase change material around a surface of [[each of]] a [[plurality of identical]] motor [[components]] component comprising:

- a) providing a [[plurality of identical]] motor [[components]] component;
- b) placing [[one of]] said [[plurality of identical]] motor [[components]] component in a mold cavity of an injection molding machine having a controllable fill rate and a controllable injection pressure;
- c) closing said mold cavity;
- d) injecting a molten phase change material into said mold cavity at a fill rate and injection pressure;
- e) monitoring and controlling pressure in the mold cavity during the injection of the molten phase change material; and
- f) controlling [[either]] the fill [[rate or injection pressure or both]] of said molten phase change material during the injection of the molten phase change using a valve gate to obtain said motor component with the phase change material thereon[; and
- g) repeating steps b)-f) to produce said plurality of motor components each having a substantially uniform resonance spectrum]].

47. (Currently amended) The method of claim 46 wherein the pressure is monitored at [[an injection to the mold cavity,]] a beginning-of-fill point and an end-of-fill point.

53. (Currently amended) The method of claim 46 wherein said plurality of said motor components comprise at least one hundred components with

phase change material thereon, said at least one hundred components having a median first order frequency and wherein each of said at least one hundred motor components with a phase change material thereon has a first order frequency that is within about three hundred Hertz of said median first order frequency.

58. (Currently amended) The method of claim [[1]] 46 wherein the phase change material has a coefficient of linear thermal expansion of less than  $2 \times 10^{-5}$  in/in/°F throughout the range of 0°F to 250°F.

59. (Currently amended) The method of claim [[1]] 46 wherein the phase change material has a coefficient of linear thermal expansion in the X, Y and Z directions, wherein the coefficient of linear thermal expansion is lowest in the X direction, and wherein the coefficient of linear thermal expansion in the Y and Z directions is no more than four times the coefficient of linear thermal expansion in the X direction.

60. (Currently amended) A method of reducing sympathetic system wide resonances of components in a hard disc drive comprising:

- a) providing a hard disc drive component;
  - b) determining a desired resonance spectrum of said hard disc drive component;
  - c) placing said hard disc drive component in a mold cavity of an injection molding machine having a controllable fill rate and a controllable injection pressure;
  - d) closing said mold cavity;
  - e) injecting a molten phase change material into said mold cavity at a fill rate and an injection pressure;
  - f) monitoring and controlling the pressure in the mold cavity;
- and



g) monitoring and controlling the fill rate of said molten phase change material and injection pressure to obtain said hard disc drive component with the phase change material thereon, having said desired resonance spectrum.

62. (Original) A method for injection molding a layer of phase change material around a surface of a plurality of identical hard disc drive components comprising:

- a) providing a plurality of hard disc drive components;
- b) placing one of said plurality of hard disc drive components in a mold cavity of an injection molding machine having a controllable fill rate and a controllable injection pressure;
- c) closing said mold cavity;
- d) injecting a molten phase change material into said mold cavity at desired fill rates and injection pressures;
- e) monitoring pressure in the mold cavity;
- f) controlling the injection pressure of said molten phase change material to obtain said hard disc drive component with the phase change material thereon having a reproducible resonance spectrum; and
- g) repeating steps b)-f) to produce said plurality of components each having a substantially uniform resonance spectrum.

63. (Currently amended) The method of claim 62 wherein the pressure is monitored at [[a runner to the mold cavity,]] a beginning-of-fill point and an end-of-fill point.

67. (Currently amended) The method of claim 62 wherein said plurality of said hard disc drive components comprise at least one hundred components with phase change material thereon, said at least one hundred components having a median first order frequency and wherein each of said at least one hundred hard disc drive components with a

phase change material thereon has a first order frequency that is within about three hundred Hertz of said median first order frequency.

73. (Currently amended) The method of claim ~~[[1]]~~ 62 wherein the phase change material has a coefficient of linear thermal expansion in the X, Y and Z directions, wherein the coefficient of linear thermal expansion is lowest in the X direction, and wherein the coefficient of linear thermal expansion in the Y and Z directions is no more than four times the coefficient of linear thermal expansion in the X direction.

74. (Original) A method of injection molding hard disc drive components having a reproducible resonance spectrum comprising:

- a) providing at least one hundred identical hard disc drive components; and
- b) over-molding a monolithic body of phase change material on a surface of said hard disc drive components using an injection molding process, wherein said components with a phase change material thereon have a median first order frequency and wherein each of said at least one hundred hard disc drive components with a phase change material thereon has a first order frequency that is within about one hundred Hertz of said median first order frequency.

75. (Original) A method of injection molding hard disc drive components having a reproducible resonance spectrum comprising:

- c) providing at least one hundred identical hard disc drive components, wherein each of said components has a resonance spectrum; and
- d) over-molding a monolithic body of phase change material on a surface of said hard disc drive components using an injection molding process, wherein the resonance spectra of said at least one hundred hard disc drive components with phase change material thereon have a standard deviation of first order resonance frequency that is at least about fifty percent less than the

standard deviation of first order resonance frequency for the same number of the same components over-molded with an injection molding process wherein only injection pressure and either injection time or stroke of an extrusion screw are controlled.

76. (New) A method of manufacturing motors having a reproducible resonance spectrum comprising:

- a) providing a plurality of identical motor component sets, wherein each of said sets consists of components that are used in a single motor;
- b) placing and positioning one of said plurality of motor component sets in a mold cavity of an injection molding machine;
- c) closing said mold cavity;
- d) monitoring the pressure inside the mold cavity;
- e) injecting a molten phase change material into said mold cavity to a pre-determined cavity pressure gradient; and
- f) repeating steps b)-e) to produce a plurality of motors each having a substantially uniform resonance spectrum.